ON *LEPTOPSYLLA TASCHENBERGI* WAGNER 1898

BY

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In a paper on the Fleas of Aserbeidschan, S. E. Transcaucasia, Wagner & Argyropulo (1934, Zeitsch. Parasitenk., 7 : 227) express the opinion that the Algerian *Leptopsylla amitina* J. & R. (1914, Novit. Zool., 21 : 237, fig. 3, ♂, Oran) is synonymous with the Russian *Leptopsylla taschenbergi* Wagner (1898, Hor. Soc. Ent. Ross., 31 : 577, ♀, Woronesch) («or in any case only a race of it»), and in 1935 Wagner (Konowia, 14 : 221) catalogued *amitina* as a synonym, the name being also placed in the synonymy of *L. taschenbergi* by Da Costa Lima & Hathaway in their Catalogue of Pulgas (1946 : 195). As the differences between Russian and Algerian specimens are very obvious the action in 1935 of a student of Suctoria with Wagner's wide experience and knowledge would be puzzling if there were not an equally obvious explanation of his taxonomic error. *Leptopsylla taschenbergi* was originally based on a single ♀. In a foot-note, evidently added when Wagner corrected the proofs of his article, it is stated that after the description had been printed a pair of the species was received on loan from A. Poppe, Vegesack near Bremen, North Germany, obtained on *Myoxus glis*. At that time the study of Suctoria was still in its infancy, and it was quite natural that Poppe's pair was not recognized as being different from the Voronezh ♀ (type of *taschenbergi*). However, it was this misidentification which misled Wagner. In 1903 (Hor. Soc. Ent. Ross., 36 : 150, pl. 2, fig. 7) he records the rediscovery of the species by König in the Caucasus and gives a figure of the claspers (pincers) of *taschenbergi*. This figure agrees on the whole well with the

figure we gave of *amitina*, a sufficient reason for sinking *amitina* as a synonym of *taschenbergi*. Nevertheless, this logical conclusion is wrong because it is based on a false premise: Wagner's figure does not represent the pincers of a Russian ♂, but of the ♂ in the Poppe collection, which is *amitina* or very close to it. In 1931 I received from Professor Titschack, for revision of the determination, the fleas of the Staatsmuseum of Hamburg, among which were the specimens of the Poppe collection. I took the opportunity to make sketches of the somatics of the pair, named by Wagner *Ctenopsylla taschenbergi*, essential for identification (*Ctenopsylla* Wagner 1893 is a synonym of *Ctenopsyllus* Kolenati 1863 preoccupied by *Ctenopsyllus* Kolenati 1856 and replaced by *Leptopsylla* J. & R. 1911). Copies of some of these sketches are reproduced in the present paper.

When the Charles Rothschild collection received Russian specimens of the flea in question (kindly presented by Professor I. Ioff) no doubt was left that *amitina* was not a synonym of *taschenbergi*. So we had the choice either to regard the two fleas as being subspecific populations of one species or to treat each population as a distinct species. There being no a-priori criterion as to which are specific and which subspecific morphological differences, the answer to the question must remain rather arbitrary in cases like this where the knowledge of the distribution of the various existing populations is so meagre. There are no intergradations between *taschenbergi* and *amitina* in our collection, but large districts of the ranges of these fleas are still unexplored as to their flea-population and possibly harbour forms linking east with west. As long as there is no evidence to the contrary the subspecific treatment of forms which replace each other geographically is a simplification of systematics preferable to recording them as species of doubtful specificness. Accordingly the three populations I can define are dealt with in the account here following as subspecies of *Leptopsylla taschenbergi*.

1. **Leptopsylla taschenbergi taschenbergi** Wagner 1898.

(Fig. 1; fig. 4, A^1-A^3; fig. 5, A^1-A^4)

Ctenopsylla taschenbergi Wagner 1898, Hor Soc. Ent. Ross. 31 : 577 (Woronesch, 1 ♀, nec foot-note).

Leptopsylla taschenbergi, Jordan 1932, Mitt. Naturw. Inst. Sofia, 5 : 148 (Bulgaria, ♀).

Leptopsylla taschenbergi, Da Costa Lima & Hathaway 1946, Pulgas : 194, 195 (partim).

We have 3 ♂♂ and 2 ♀♀ from the Northern Caucasus, identified and presented by Professor I. Ioff, host not mentioned. Also recorded from Transcaucasia, whence we have no specimens.

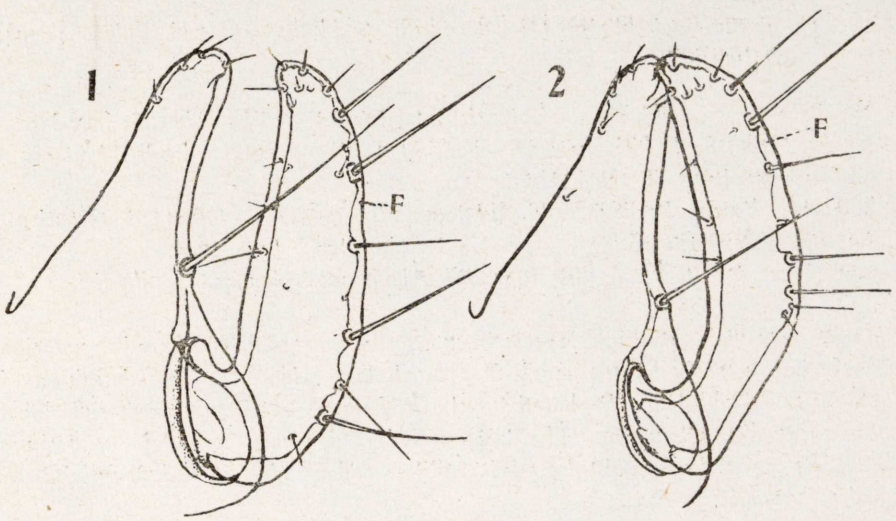
Bulgaria: Varna, Kamcija, and Rhodope, off *Apodemus sylvaticus sylvaticus*, *A. flavicollis*, *Microtus* sp., 3 ♂♂, 1 ♀, October 1927, June 1935.

Jugoslavia: Korab Mts., July 1935, off *Apodemus sylvaticus stankovici*, 1 ♂, 2 ♀♀.

These specimens possibly represent more than one subspecies; the question can only be answered by the study of a much larger material. The definition of a subspecies should really be based on the knowledge of the range of individual variability of the population. The large number of specimens of *L. t. amitina* collected by me in 1950 in the Pyrenees exhibits conspicuous individual differences in many parts of the flea.

♂. Sternum VIII bears all the bristles in the apical area, there being at most some minute hairs in or near the middle; the numbers of bristles varies in our Caucasian specimens from 16 to 20, in the Bulgarian ones from 16 to 18 and the Serbian one has on the left side of the segment 16 and on the right side 15. The digitoid F (fig. 1) is broadest in the lower half, being here a little narrower in the Serbian example than in the others; the position of the bristles at the posterior margin is almost constant except that in the Serbian ♂ the lowest long bristles are placed a little farther from the base than in the ♂♂ from Russia and Bulgaria. The ventral apical sclerite of the phallosome offers an easily seen subspecific difference. This process, one each side, is movable up and down as in other *Leptopsyllidae*, curved and apically dilated, as shown in fig. 4 A to C. In the Russian ♂♂ the ventral area ends with a truncate-sinuate process (ap), which is a little longer than broad and slightly variable in shape in the three specimens; from this process the apical margin extends forwards and forms with the prolongation of the dorsal margin

(dm) of the median portion of the sclerite a very sharp angle; along this dorsal margin runs a transparent crest which widens distally more or less. In the Bulgarian ♂♂ the apical process (ap, fig. 4, A^2) is shorter, but has the same truncate-sinuate apex, the crest is wider in the specimen from which the figure is taken; in the Jugoslavian single ♂ the apical process (fig. 4, A^3), is



Figs. 1-2.—1: Clasper of *L. t. taschenbergi*. 2: Clasper of *L. t. amitina*.

narrower and almost pointed. In all three populations the line indicating the dorsal margin of the sclerite is single, a thin line branching off at the beginning of the apical dilatation and running (on the inner side) to the dorsal side of the apical projection (ap). The shape of the digitoid F and of the process ap suggests that the Jugoslavian population of *L. taschenbergi* is possibly subspecifically distinct.

♀. In the two Russian and one Bulgarian specimens of this sex the apical margin of sternum VII (fig. 5 A^1, A^2, A^3) is deeply and broadly sinuate, the lobe above the sinus being triangular and rather long. In the one Jugoslavian ♀ (fig. 4, A^4) with this sternum intact (in the second example the margin is partially broken away) the sinus is placed higher up the side and a little smaller, which is again an incline towards West-European *amitina*.

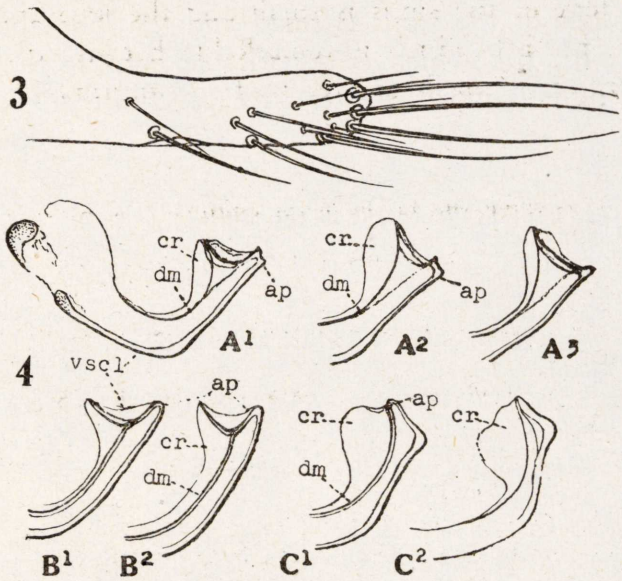
2. **Leptopsylla taschenbergi calamana** subsp. n.

(Fig. 4, B^1-B^2; fig. 5, B^1-B^3)

Leptopsylla amitina Jordan & Rothschild (erron. determ.) 1915, Novit. Zool., 22 : 310, fig. 2, ♀♀.

Eastern Algeria: Hammam Meskoutine, May 1914, on *Apodemus slyvaticus hayi*, 4 ♂♂, 7 ♀♀.

When recording these specimens as *L. amitina* we had only the solitary ♂ from Oran with which to compare them. The small differences (small in a quantitative sense) from that ♂ were



Figs. 3-4.—1: Left half of sternum VIII of ♂ of *L. t. amitina*. 4: Ventral apical sclerite of phallosome of *L. t. taschenbergi*, A^1 & A^3; *L. t. calamana*, B^1 & B^2; *L. t. amitina*, C^1 & C^2.

regarded to be due to individual variability. Having now a large series of ♂♂ of *amitina* all of which agree with the type of *amitina* in the shape of the ventral apical sclerite of the phallosome, the different apex of this sclerite in the Hammam Meskoutine ♂♂ has become a characteristic distinction.

♂. Clasper as in *L. t. amitina*, the basal third of F narrower than in *L. t. taschenbergi* and the lower bristles of the posterior

side much farther away from the base. The ventral area of the ventral apical sclerite of the phallosome (fig. 4, B^1, B^2) ends apically with a conical process, which is longer than broad and has a rounded apex; the dorsal margin of the sclerite is marked by a double line whiuh is continuous with the double line of the apical process; the apex of the sclerite is rather deeply concave between the process and the crest (cr). Sternum VIII as in *L. t. amitina,* usually with one or two bristles isolated and placed near the division of the segment into a right and a left half; the total number of bristles on each half varies from 13 to 18, the average being smaller than in *L. t. taschenbergi* and larger than in *L. t. amitina.*

♀. The apical margin of sternum VII is either without sinus and lobe or the sinus is small and the lobe above it short (fig. 5, B^1, B^2, B^3), which is remarkable because the variability of the sternum is much greater in *L. t. amitina.*

3. **Leptopsylla taschenbergi amitina** J. & R. 1914.

(Fig. 2 & 3; fig. 4, C^1 & C^2; fig. 5, C)

Leptopsylla amitina Jordan & Rothschild 1914, Novit. Zool., 21 : 237, fig. 2, ♀ (Oran).

Ctenopsylla taschenbergi Wagner 1898, Hor. Soc. Ent. Ross., 31 : 577 partim, foot-note).

Ctenopsyllus taschenbergi Wagner 1935, Konowia 14 : 221 (*amitina* a synonym of *taschenbergi*).

Leptopsylla taschenbergi, Da Costa Lima & Hathaway 1946, Pulgas : 195 (*amitina* in the synonymy of *taschenbergi*); Gil Collado, 1948, Eos, 24 : 252 (Spain); idem, 1949, Rev. Iber. Parasit., 9 : 238 (Cercedilla, 1 ♂).

In the Charles Rothschild collection of the British Museum specimens from:

Algeria: Bou-Médine, Oran, April 1913, 1 ♂, off *Apodemus sylvaticus hayi.*

Andorra: Las Escaldas, June-July 1950, off *Apodemus sylvaticus callidipes,* a small series.

France: Porté, Pyrénées Orientales, July 1950, 1 ♂ of the same host; Tarascon-sur Ariège, May-June 1950, off the same host, a large series of both sexes; Fabian, Hautes Pyrénées, September 1949, off the same host, 2 ♀♀.

We have not found any differences between the Oran ♂ and the series of Pyrenean ♂♂ and expect that also the Spanish flea recorded as *L. taschenbergi* will be found to belong to this

subspecies. Only a portion of the Pyrenean specimens have so far been cleared, mounted and studied. A more complete account of the variability exhibited by the series of well over 100 specimens will be available for publication when the entire Pyrenean collection of fleas has been studied.

♂. Sternum VIII bears on each side of the body from 9 to 14 bristles, average 11.4 in 17 specimens (34 sides). As a rule

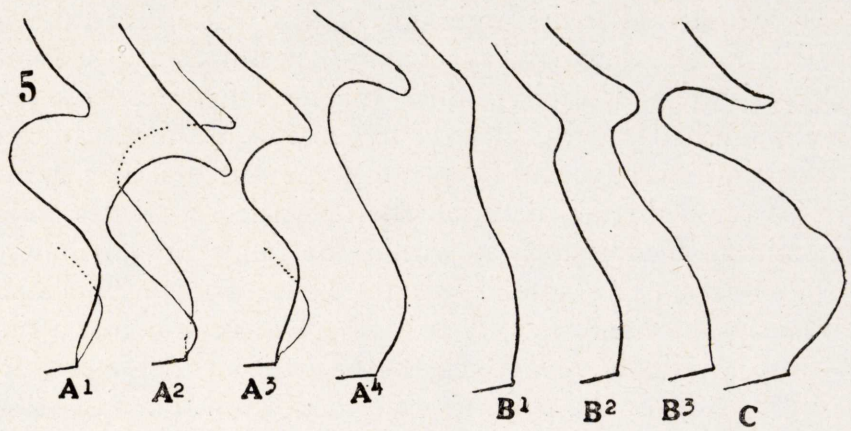


Fig. 5.—Abdominal sternum VII of: *L. t. taschenbergi*, A^1 & A^4; *L. t. calamana*, B^1 & B^3; *L. t. amitina*, C.

one or two bristles placed near the division of the segment are separated from the more distal bristles by a variable interspace. The digitoid F of the type (fig. 2) has been redrawn, the proportions of the original figure not being quite correct. It differs markedly from the digitoid of *L. t. taschenbergi* (fig. 1) in its proportions and the position of the lower bristles of the posterior margin. Though there is some variability in the Pyrenean series, the digitoid remains essentially the same as in the type of *amitina*. The apical ventral movable sclerite of the phallosome is distally more curved than in the two previous subspecies; the apical ventral process is conical as in *L. t. calamana*, but directed upwards, the ventral area bulges out subapically, forming a rounded elbow (visible even in unmounted specimens) (fig. 4, C^1), the dorsal margin (dm) of the sclerite is indicated on the slides by a double line which runs upwards in an even curve and is continuous with the double line of the apical process; the crest

(cr) is usually broad and rounded, but often less widened than in fig. 4, C^1.

♀. (None known from North Africa.) The variability of sternum VII is considerable. Most of the specimens have a distinct sinus which is narrower than in true *taschenbergi;* the lobe about it varies very much in length and width; the extremes resemble fig. 5, B^1 and C.

The pair Wagner received for determination from Poppe, to which we referred at the beginning of this article, fits quite well into the range of variability of *amitina.* But as the specimens have perished and we have only Wagner's figure of 1903 and my unpublished sketches of 1931 to guide us in the identification of the pair, I reproduce here copies of three sketches. The sternum VIII of the ♂ (fig. 3) bears on the left half 14 bristles and on the right half 11, which is within the range of variability of *L. t. amitina.* The apical ventral sclerite of the phallosome, however, is different in the dorsal margin being drawn as a single line (fig. 4, C^2). In my sketch of the digitoid (not reproduced) the fifth bristle of the posterior margin is much shorter and very much thinner than the fourth, which is not the case in any of the 17 mounted ♂♂ of *L. t. amitina* examined. The lobe above the sinus of sternum VII of the ♀♀ (fig. 5, C) is long and narrow which rarely occurs to this extent in our series. If my sketches are correct, the digitoid and phallosome possibly indicate that Poppe's pair was obtained in a faunistic district whence no further specimens are as yet known. The locality Vegesack attributed to the pair by Wagner was a guess; no locality is mentioned on the slides and it is unlikely that *Glis glis* occurs in the North German plain west of the Elbe. The occurrence on *Glis glis* was accidental for this mouse-flea.

It will interest taxonomists that in our Pyrenean series are a few specimens which have a small additional spine below the three normal ones of the genal comb, a fact of some significance.